LESSON 10.3

NAME _____ DATE _____

Reteaching with Practice

For use with pages 613–620

GOAL **Use inscribed angles to solve problems and use properties of inscribed polygons**

VOCABULARY

An **inscribed angle** is an angle whose vertex is on a circle and whose sides contain chords of the circle.

The arc that lies in the interior of an inscribed angle and has endpoints on the angle is called the **intercepted arc** of the angle.

If all of the vertices of a polygon lie on a circle, the polygon is **inscribed** in the circle and the circle is **circumscribed** about the polygon.

Theorem 10.8 Measure of an Inscribed Angle
If an angle is inscribed in a circle, then its measure is half the measure of its intercepted arc.

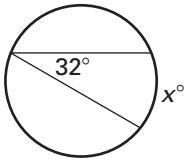
Theorem 10.9
If two inscribed angles of a circle intercept the same arc, then the angles are congruent.

Theorem 10.11
A quadrilateral can be inscribed in a circle if and only if its opposite angles are supplementary.

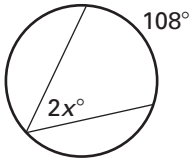
EXAMPLE 1 Finding Measures of Arcs and Inscribed Angles

Find the value of x.

a.



b.



SOLUTION

a. By Theorem 10.8,

$$32° = \frac{1}{2}x°$$

$$64 = x$$

b. $2x° = \frac{1}{2}(108°)$

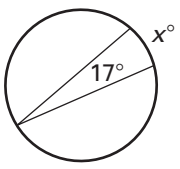
$$2x = 54$$

$$x = 27$$

Exercises for Example 1

Find the value of *x*.

1.



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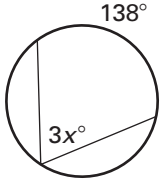
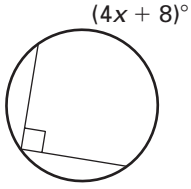


3.



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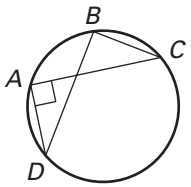
EXAMPLE 2 Finding the Measure of an Angle

If $\angle CAD$ is a right angle, what is the measure of $\angle CBD$?

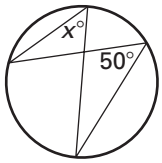


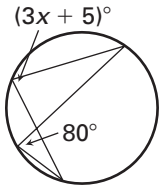
SOLUTION

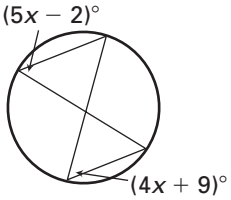
By Theorem 10.9, $m\angle CAD \cong \angle CBD$ because the two angles intercept the same arc. So, $m\angle CAD = 90°$.

Exercises for Example 2

Find the value of *x*.

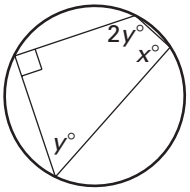
4. 

5. 

6. 

EXAMPLE 3 Using an Inscribed Quadrilateral

Find the value of each variable.



SOLUTION

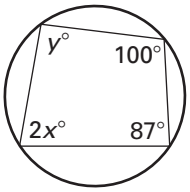
By Theorem 10.11, the opposite angles of this quadrilateral are supplementary. So you can write the following equations and then solve for the variable in each.

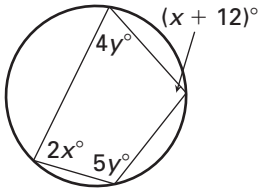
$x° + 90° = 180°$ $\qquad$ $2y° + y° = 180°$

$x = 90$ $\qquad$ $y = 60$

Exercises for Example 3

Find the value of each variable.

7. 

8. 

9.